

Quarterly Progress Report

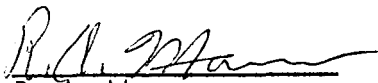
"Investigation of Surface Ionization on Metallic Surfaces"  
Contract NAS8-2585

Reporting Period: September 16, 1965 - December 15, 1965

Considerable effort has been made to prepare and leak test a chamber that will be used as a metal field emission microscope tube. The metal components of this tube were machined and subsequently inert gas welded together. Only one small leak was discovered in the leak test which consisted of connecting the system to a vacuum system and using an electronic halogen detector with Refrigerant 22. This leak was repaired and consequently other tests indicated that the chamber is leak tight down to  $10^{-7}$  Torr. There might be still some extremely minute leaks which could become a factor at  $10^{-9}$  or  $10^{-10}$  Torr range. These can not be detected until the system is evacuated to that low pressure level.

Most of the feedthroughs and field emitter holder assemblies have been fabricated. There are a few items that require vacuum brazing.

After this, the vacuum pumping system must be prepared. Presently, there is a question as to what type of pumps will be used. Ion pumping appears to be quite reasonable but the pump manufacturer must be selected. This will be done after a careful mass spectrometric analysis of the composition of the residual gases has been made on the Varian Associates' Low Energy Electron Diffraction System.

  
R. A. Mann  
Principal Investigator

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